be induced to come into intimate contact with the water in the cooler, and the temperature and humidity of this air at inlet. I'nder average conditions a chimney cooler of 19 it. X 19 ft. section, and about 60 ft. high, can deal with about 20,000 gall, of water per hour. A cooler 54 ft. x 26 ft. by 65 ft. high can cool about 100,000 gall, per hour, and to cool 300,000 gall. per hour requires about 164 ft. X 24 ft. by 70 to So ft. high.

The tank under the tower is usually built of concrete when erected at ground-level, and this also forms the foundations for the tower. But if the tower is elevated the tank may be built of up east-iron sections bolted together. The capacity of the tank ought to allow the tower to be operated at full load for, say, twelve hours without addition of make-up supply when surface condensers are used. With jet: condensers the water of condensation mixes with the condensing water and little make-up supply is necessary, but fresh feed water is required.

The amount of air required for cooling the water may be estimated by the methods explained on p. 252, taking it that the air leaves the water at the top at a temperature 10" to 15" F. below that of the entering water, and with relative humidity of about 85 per cent.

Except for the influence of winds the current of air through the tower is induced by the difference of density of the mixture of air and vapour in the tower and that of the outside air. If there were no resistance to the ilow of the air the theoretical velocity of flow would be given by

where $v \sim$ velocity, feet per second,

g •••• acceleration due to gravity, 32 ft. per second*[1],

II   • height of cooler above opening for inlet air, feet,

- density of external atmosphere,
   mean density of gases in tower,

To allow[3'] for frictional resistance to the flow of the air the above formula

may be modified to

$$J \quad \frac{2_?H}{^vH-i'}$$

The value of F may be taken to be about 18.

With low-level condensers the cooling tower is usually arranged with the base at about ground-level if the necessary area is available, but if a barometric condenser is used the tower may be placed in an elevated position. One arrangement, due to The Davenport Engineering Co., is shown in fig. 34. The tower has been placed over the boiler house at such a level that the injection water is raised and injected because of the vacuum in the con-